SECS1024 - Laboratoire 10 - Android Diva

laboratoire not´e 8 points - 10% de la note finale

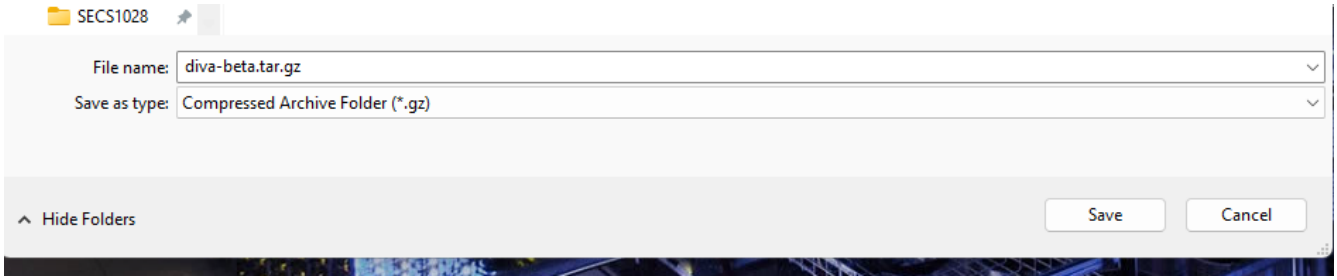
a` rendre pour le 1er avril

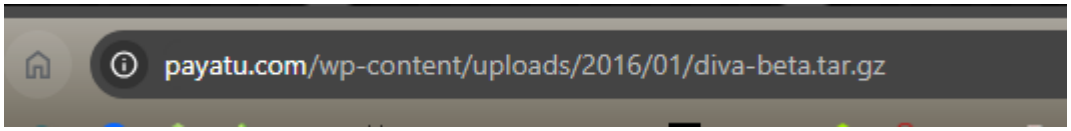
Objectif : trouver des failles de s´ecurit´e sur une application Android. Utilisez pour cela une analyse statique (le code source de l'application est visible sur https://github.com/payatu/divaandroid) et une analyse dynamique sur Android-x86 (en r´eseau interne de VirtualBox).

Mise en place du laboratoire : utilisez pour ce laboratoire une VM Android-x86 connect´ee r´eseau en interne sur VirtualBox.

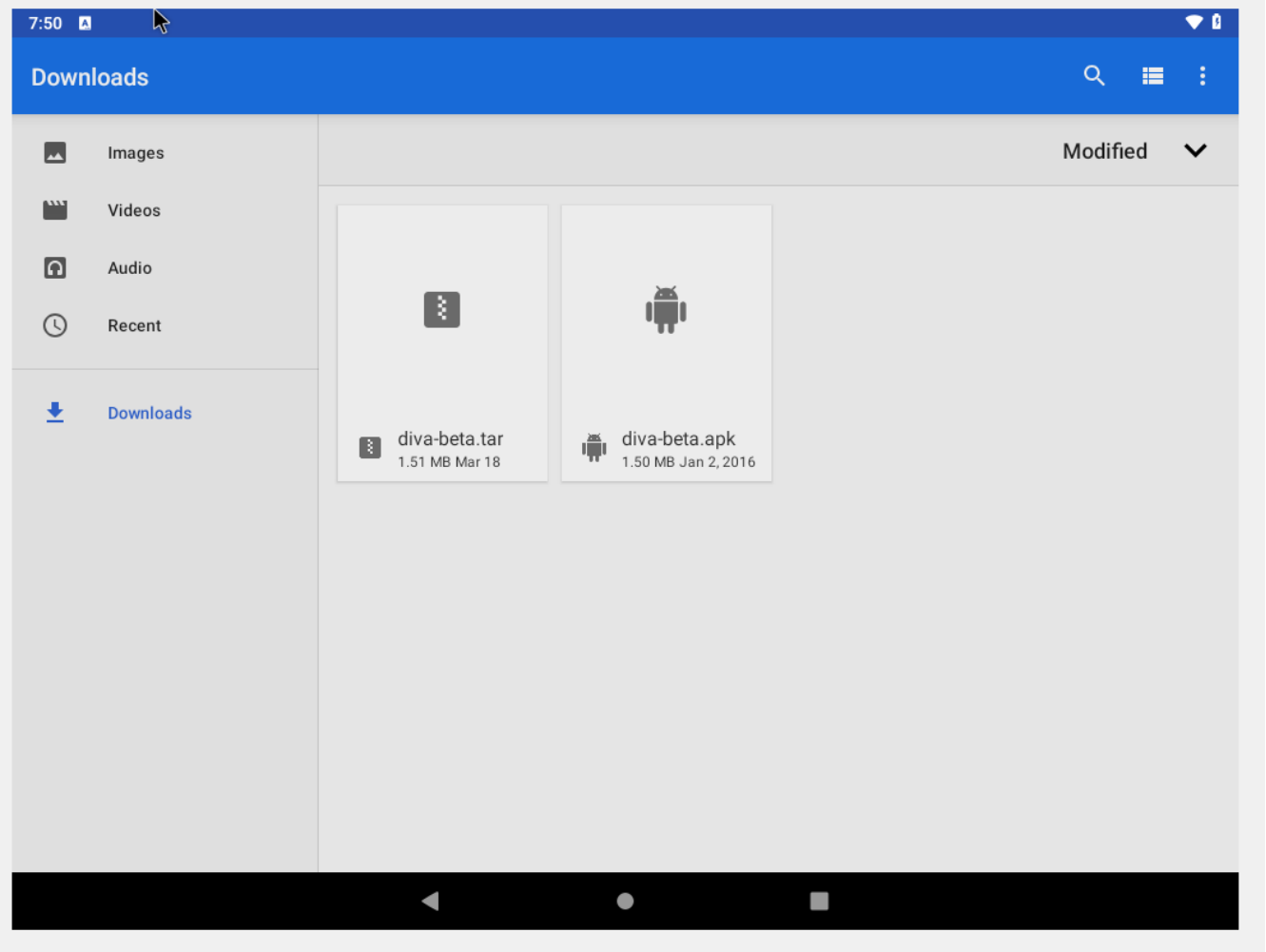
1 Installation de DIVA

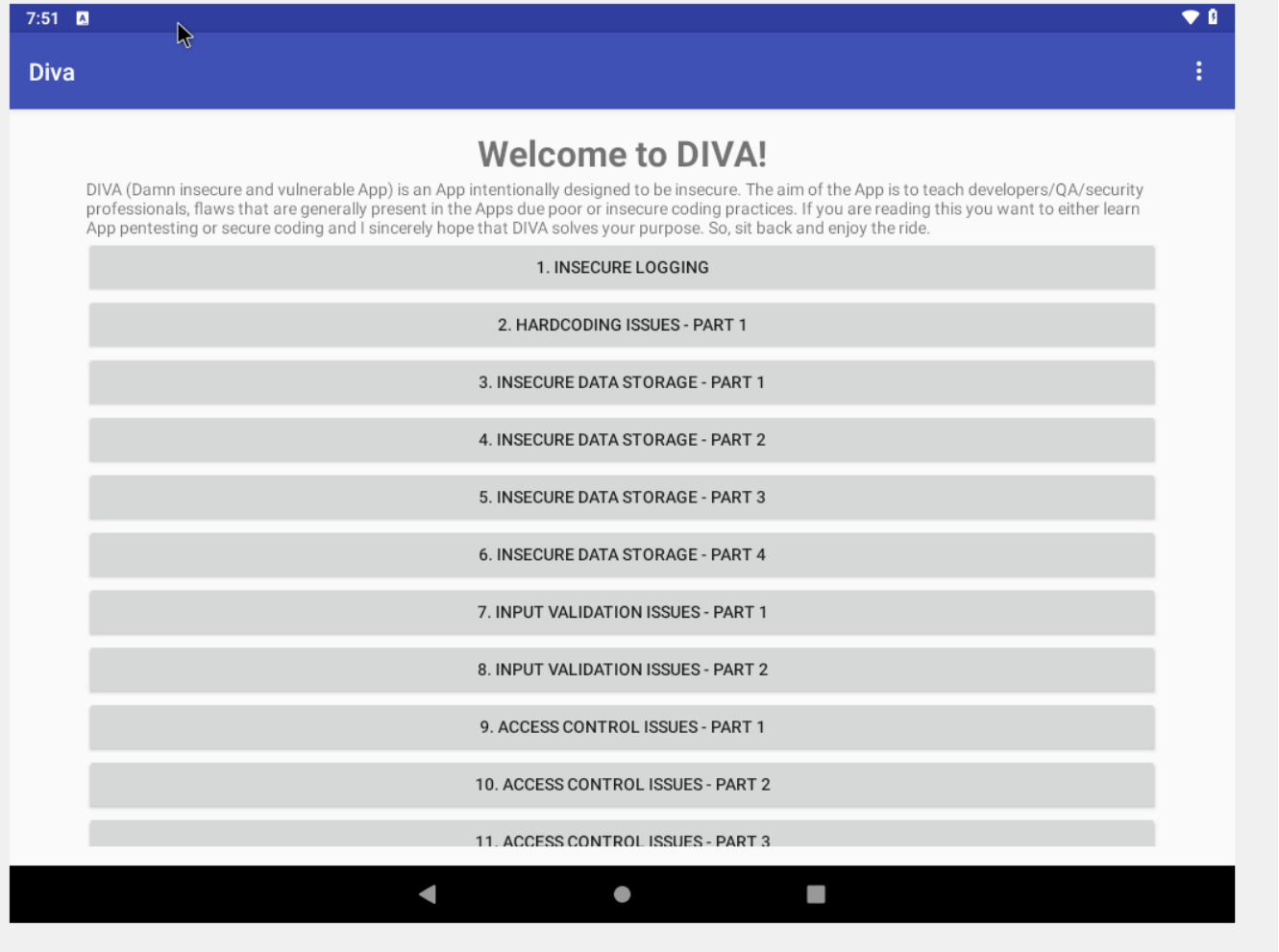
(1 point) Diva est une application Android volontairement vuln´erable. Elle est t´el´echargeabvle sur: http://www.payatu.com/wp-content/uploads/2016/01/diva-beta.tar.gz





1) installez cette application sur Android-x86 (en mode NAT) et faites une capture ´ecran de l'application ouverte. (1 point)

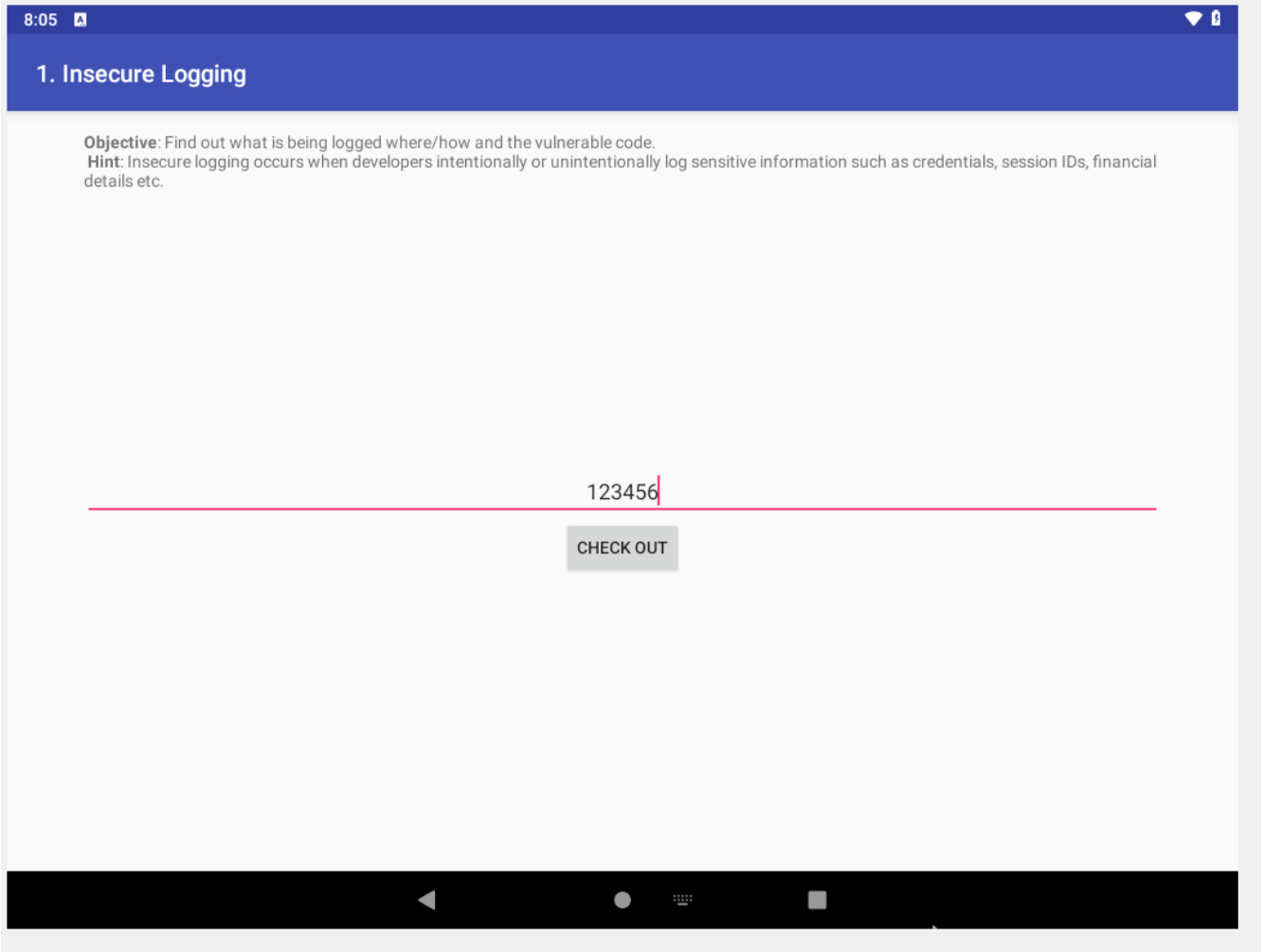




2 Probl`emes de s´ecurit´e (7 points)

Connectez l'application Diva sur le r´eseau interne VB (hors Internet).
Recherchez 7 failles de s´ecurit´e parmi les 13 probl`emes/menus propos´es.
Documentez vos r´eponses par des explications textuelles et des captures ´ecran. (1 point par probl`eme).

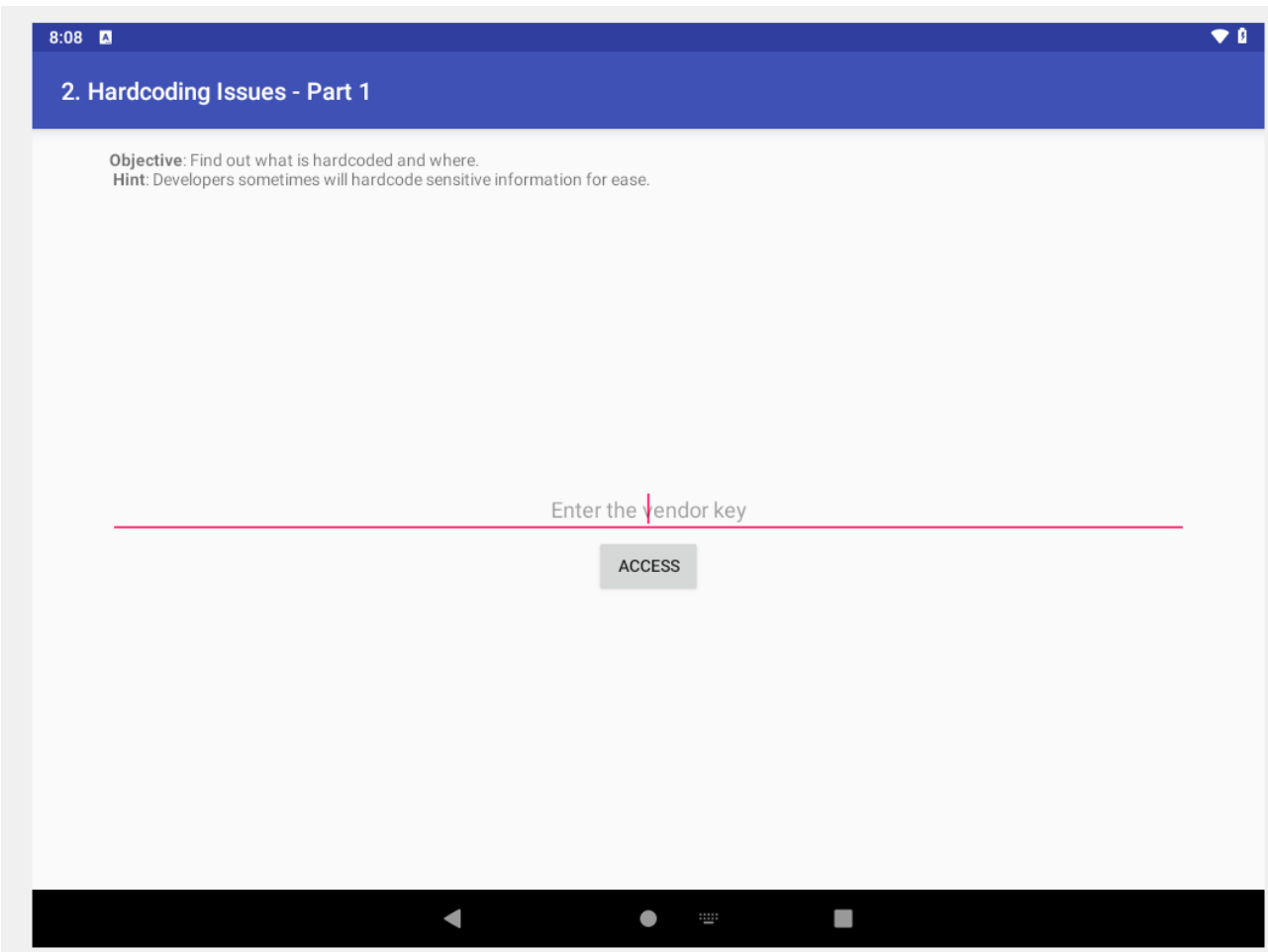
#1 insecure logging

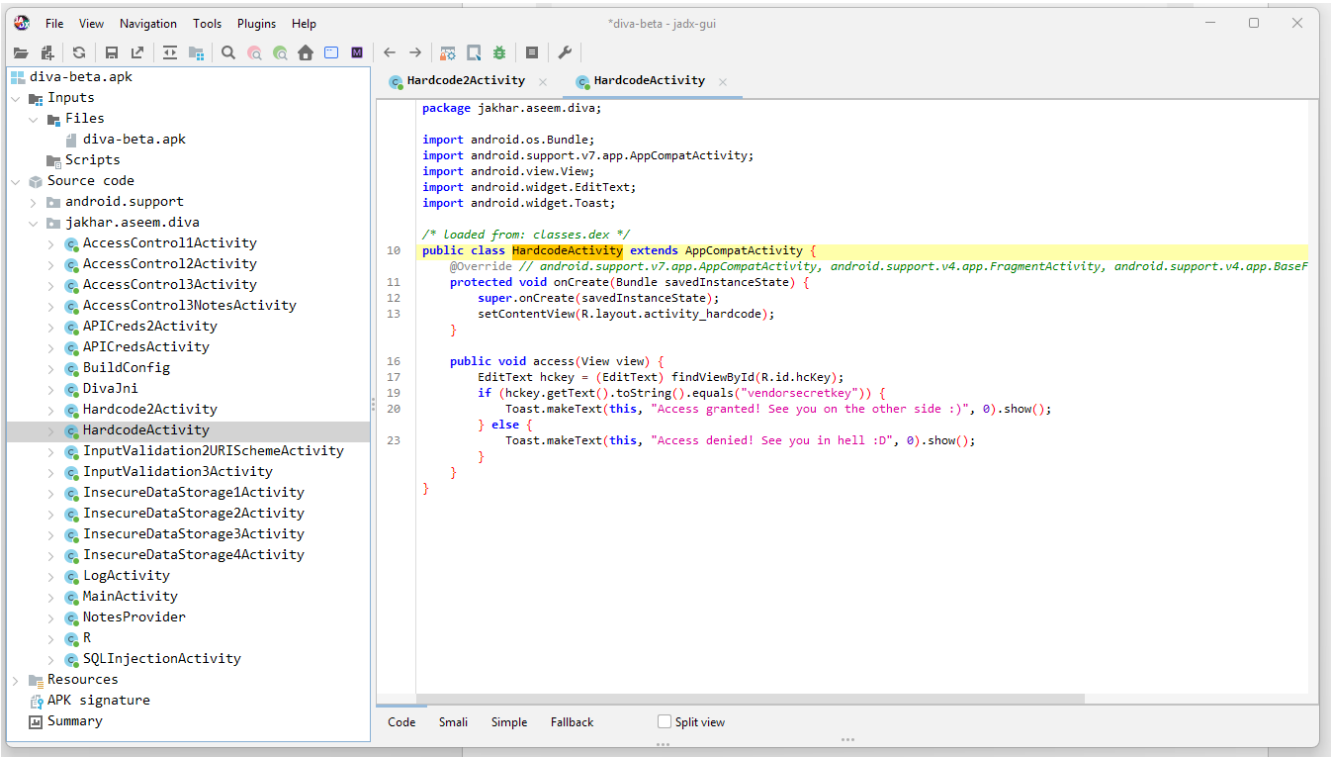


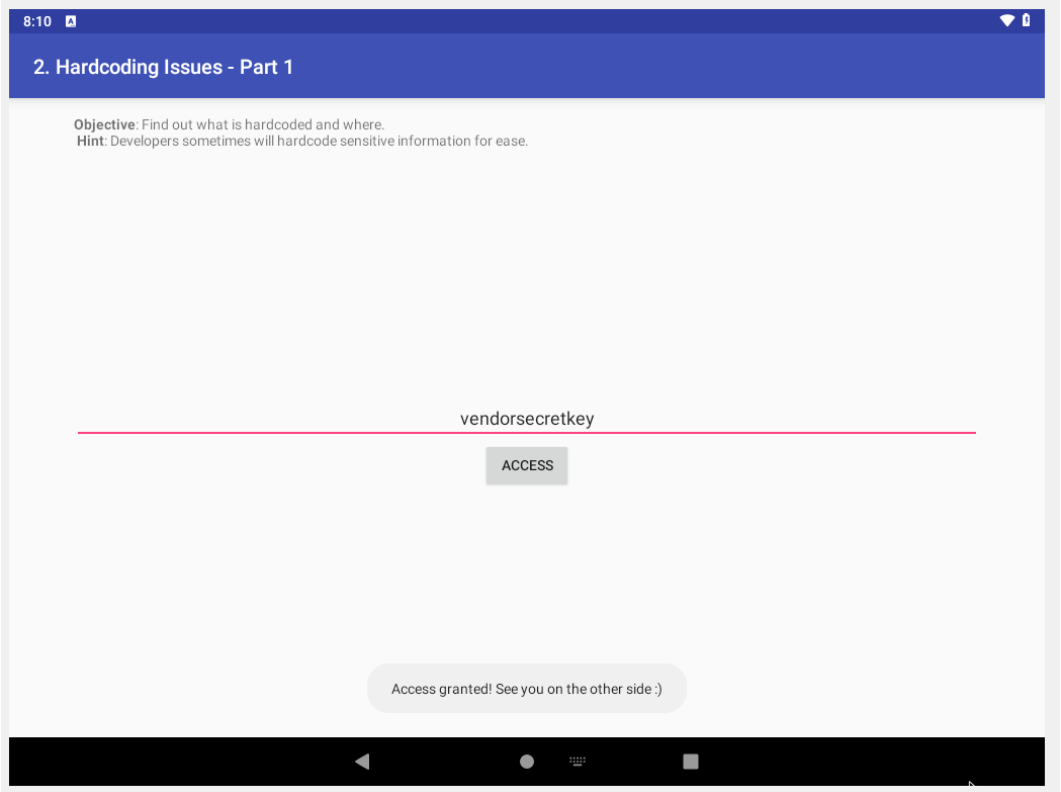

```
  Trusted GRUB now booting 'Android-x86 9.0-r2'

  Progress:  ▒▒▒▒Detecting Android-x86... found at /dev/sda1
console:/ # logcat | grep 123456
^C
130|console:/ # logcat | grep 123456
03-25 08:05:48.173  7321  7321 E diva-log: Error while processing transaction with credit card: 123456
03-25 08:05:49.122  7321  7321 E diva-log: Error while processing transaction with credit card: 123456
```

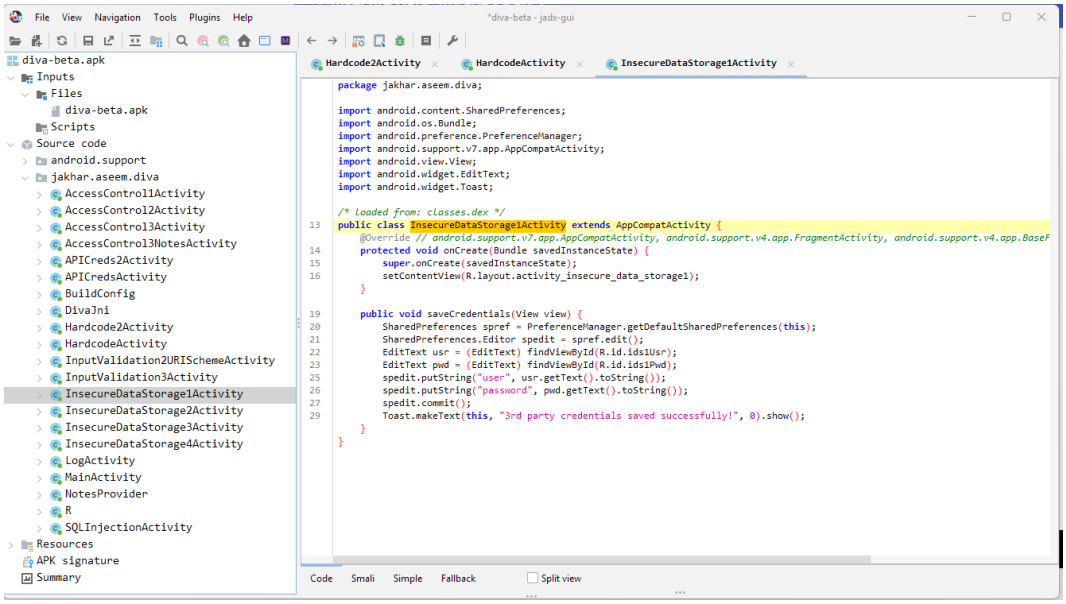
#2 hardcoding issues

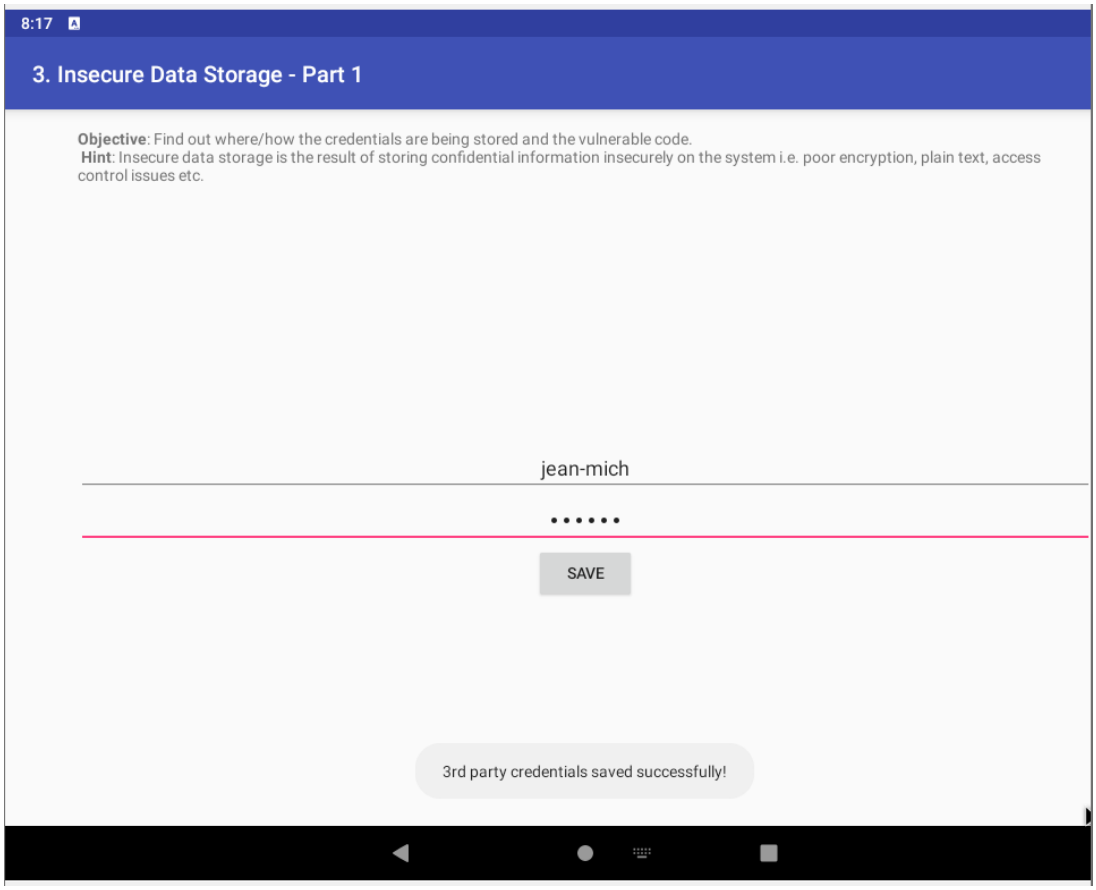

8:08
2. Hardcoding Issues - Part 1
Objective: Find out what is hardcoded and where.
Hint: Developers sometimes will hardcode sensitive information for ease.
Enter the vendor key
ACCESS


File View Navigation Tools Plugins Help
*diva-beta - jadx-gui
diva-beta.apk
Inputs
Files
diva-beta.apk
Scripts
Source code
android.support
jakhar.aseem.diva
AccessControl1Activity
AccessControl2Activity
AccessControl3Activity
AccessControl3NotesActivity
APICreds2Activity
APICredsActivity
BuildConfig
DivaJni
Hardcode2Activity
HardcodeActivity
InputValidation2URISchemeActivity
InputValidation3Activity
InsecureDataStorage1Activity
InsecureDataStorage2Activity
InsecureDataStorage3Activity
InsecureDataStorage4Activity
LogActivity
MainActivity
NotesProvider
R
SQLInjectionActivity
Resources
APK signature
Summary
Hardcode2Activity
HardcodeActivity
package jakhar.aseem.diva;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
/* loaded from: classes.dex */
public class HardcodeActivity extends AppCompatActivity {
@Override // android.support.v7.app.AppCompatActivity, android.support.v4.app.FragmentActivity, android.support.v4.app.BaseF
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_hardcode);
}
public void access(View view) {
EditText hckey = (EditText) findViewById(R.id.hcKey);
if (hckey.getText().toString().equals("vendorsecretkey")) {
Toast.makeText(this, "Access granted! See you on the other side :)", 0).show();
} else {
Toast.makeText(this, "Access denied! See you in hell :D", 0).show();
}
}
}
Code
Smali
Simple
Fallback
Split view


8:10
2. Hardcoding Issues - Part 1
Objective: Find out what is hardcoded and where.
Hint: Developers sometimes will hardcode sensitive information for ease.
vendorsecretkey
ACCESS
Access granted! See you on the other side :)

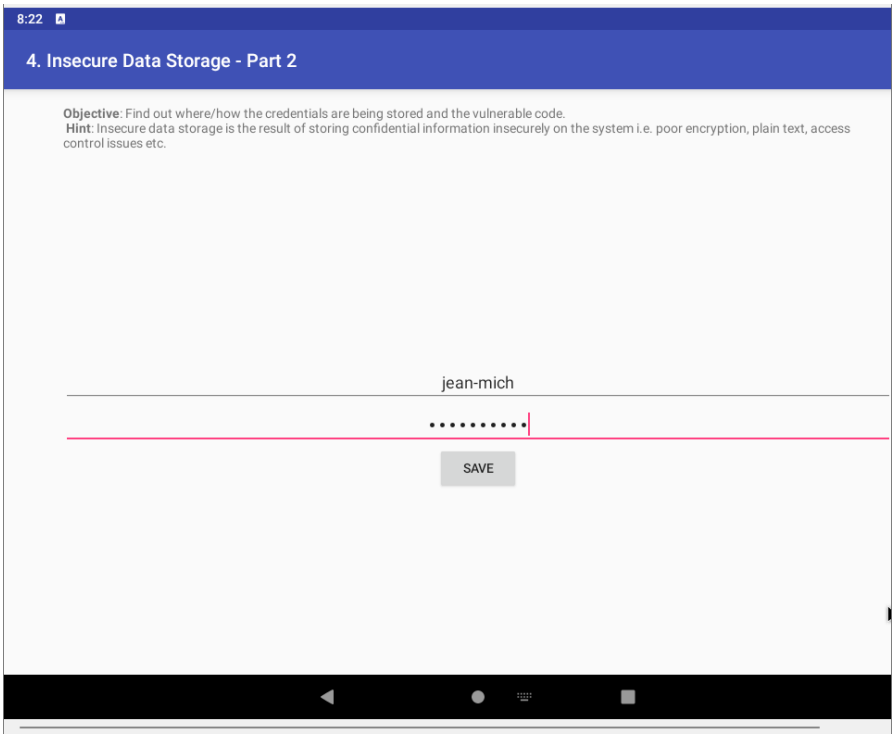
#3 insecure data storage part 1

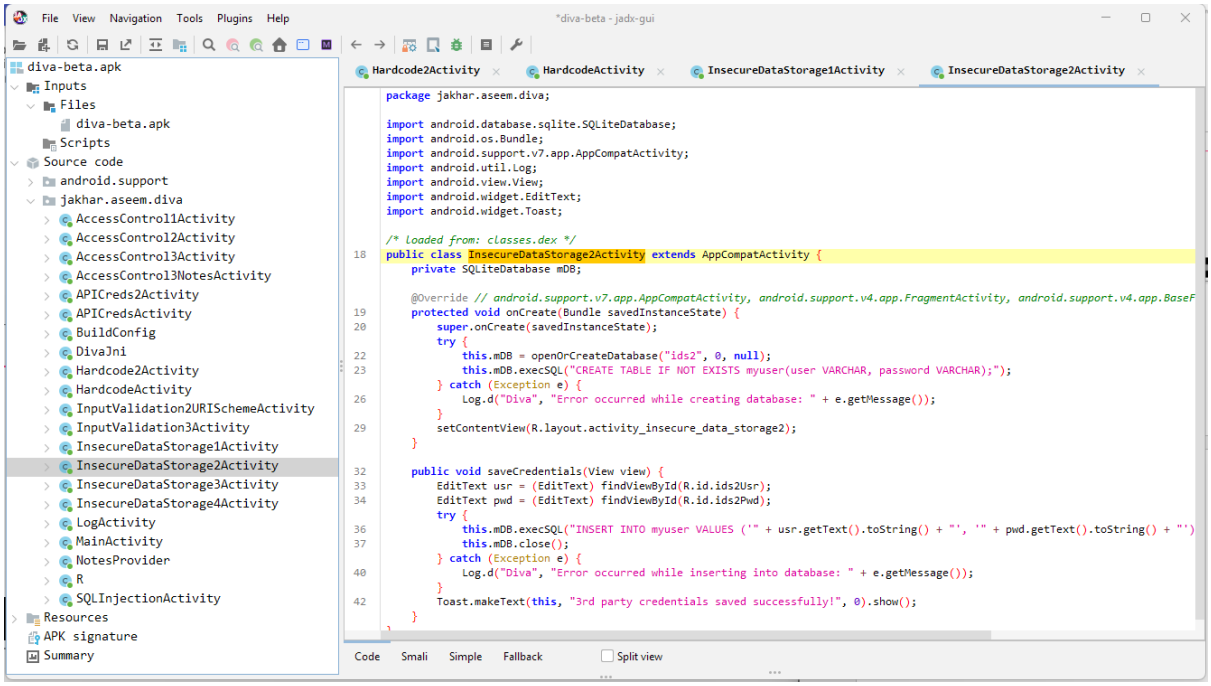




```
console:/data/data # cd /
console:/ # cd data
console:/data # cd data
console:/data/data # cd jakhar.aseem.diva/
console:/data/data/jakhar.aseem.diva # ls
cache code_cache databases
console:/data/data/jakhar.aseem.diva # ls
cache code_cache databases shared_prefs
console:/data/data/jakhar.aseem.diva # cd shared_prefs/
console:/data/data/jakhar.aseem.diva/shared_prefs # ls
jakhar.aseem.diva_preferences.xml
console:/data/data/jakhar.aseem.diva/shared_prefs # cat jakhar.aseem.diva_preferences.xml
<?xml version='1.0' encoding='utf-8' standalone='yes' ?>
<map>
    <string name="password">pierre</string>
    <string name="user">jean-mich</string>
</map>
console:/data/data/jakhar.aseem.diva/shared_prefs # _
```

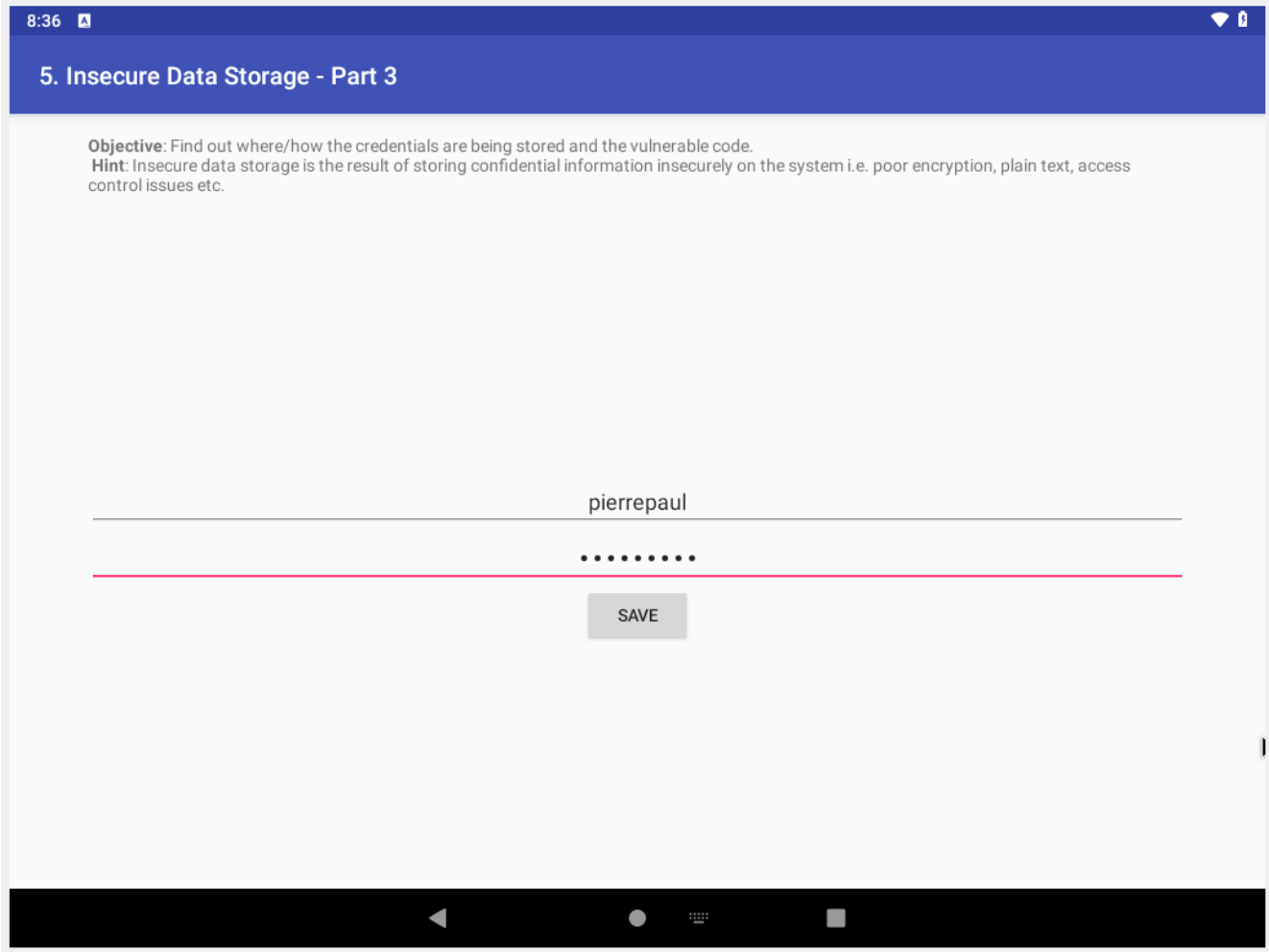
#4 insecure data storage part 2

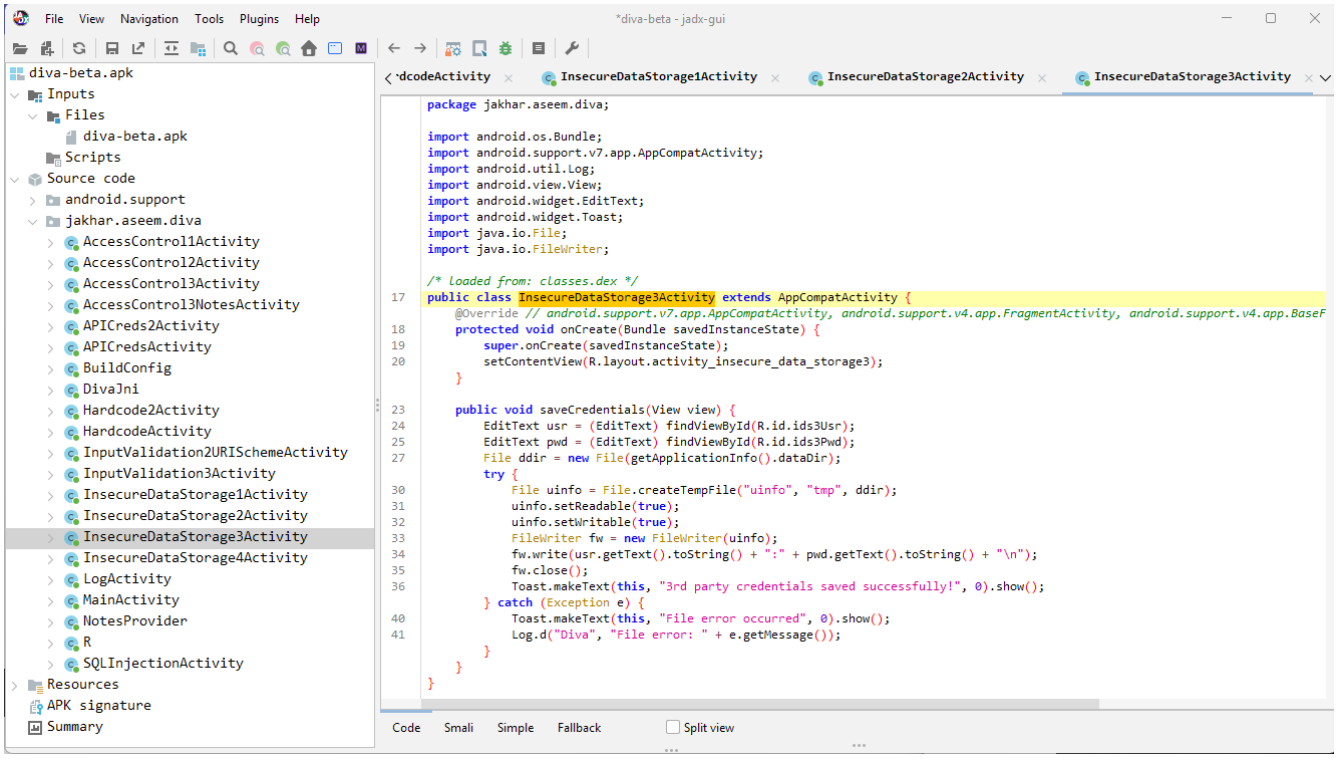





```
console:/data/data/jakhar.aseem.diva/databases # cd ../
console:/data/data/jakhar.aseem.diva # cd databases/
console:/data/data/jakhar.aseem.diva/databases # ls
divanotes.db divanotes.db-shm divanotes.db-wal ids2
console:/data/data/jakhar.aseem.diva/databases # vi ids2
```

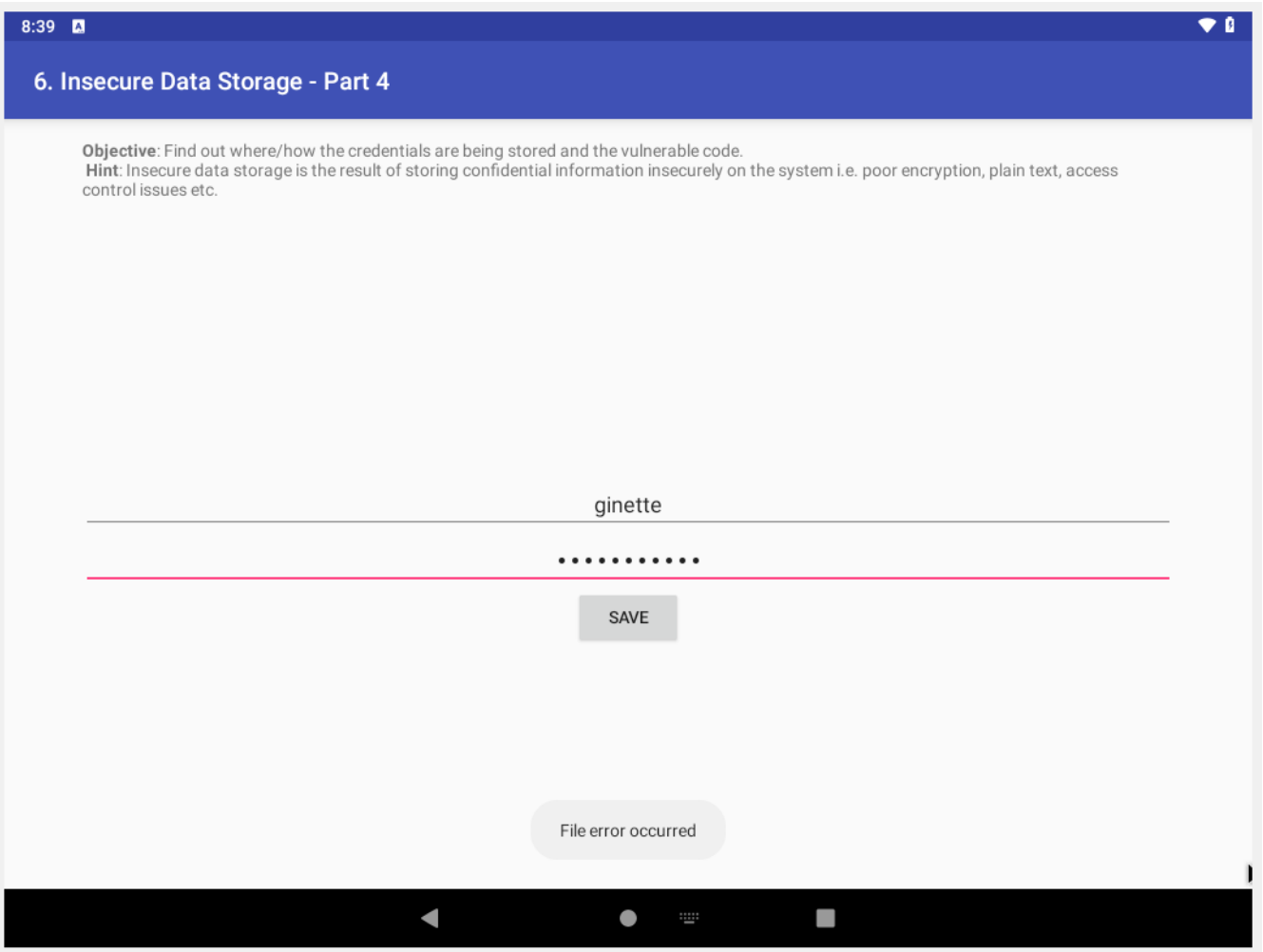
#5 insecure data storage part 3

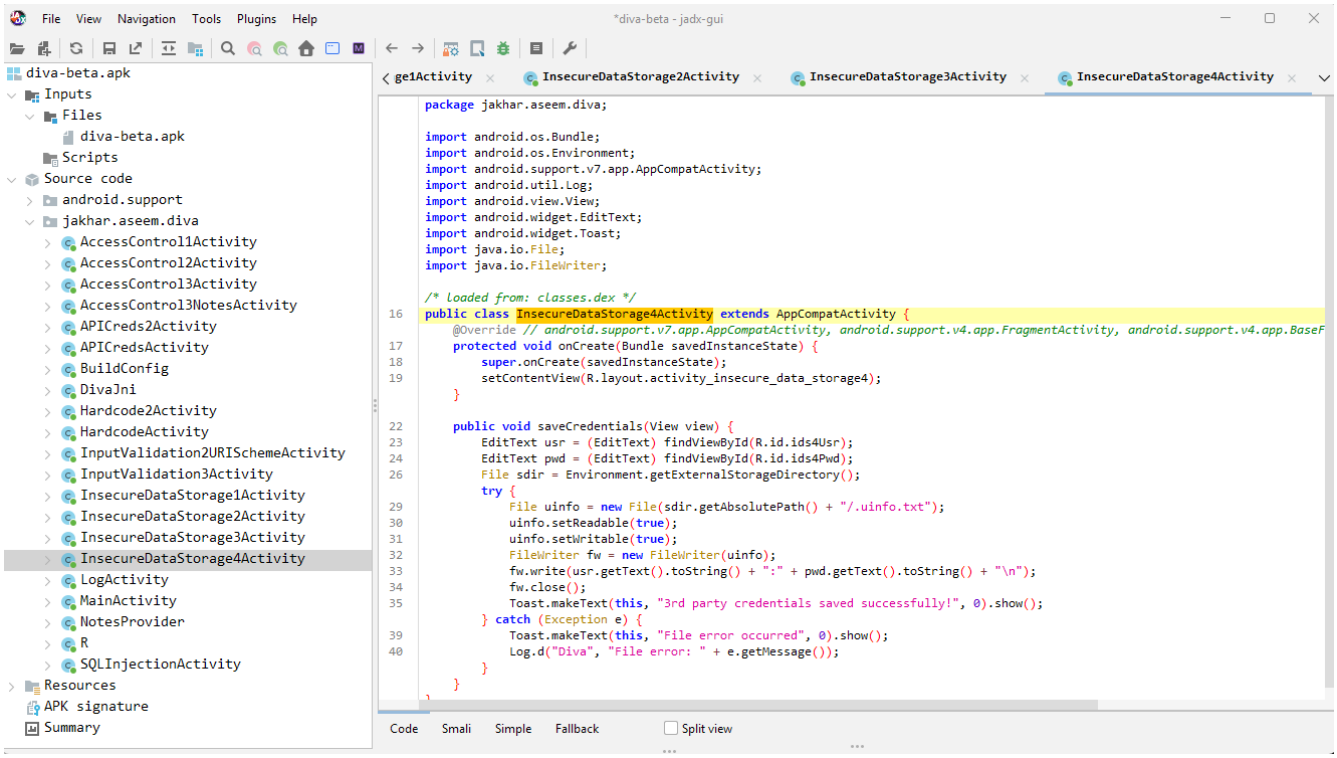

8:36
5. Insecure Data Storage - Part 3
Objective: Find out where/how the credentials are being stored and the vulnerable code.
Hint: Insecure data storage is the result of storing confidential information insecurely on the system i.e. poor encryption, plain text, access control issues etc.
pierrepaul
SAVE




```
[3] + Stopped                 \vi ids2
console:/data/data/jakhar.aseem.diva/databases # cd ../
console:/data/data/jakhar.aseem.diva # cd databases/
console:/data/data/jakhar.aseem.diva/databases # ls
divanotes.db divanotes.db-shm divanotes.db-wal ids2
console:/data/data/jakhar.aseem.diva/databases # cd ../
console:/data/data/jakhar.aseem.diva # ls
cache code_cache databases shared_prefs uinfo11634577348591701 0tmp
console:/data/data/jakhar.aseem.diva # cat
cache/                        databases/                    uinfo11634577348591701 0tmp
code_cache/                   shared_prefs/
console:/data/data/jakhar.aseem.diva # cat
cache/                        databases/                    uinfo11634577348591701 0tmp
code_cache/                   shared_prefs/
console:/data/data/jakhar.aseem.diva # cat uinfo11634577348591701 0tmp
pierrepaul:lamirande
console:/data/data/jakhar.aseem.diva #
```

#6 insecure data storage


8:39
6. Insecure Data Storage - Part 4
Objective: Find out where/how the credentials are being stored and the vulnerable code.
Hint: Insecure data storage is the result of storing confidential information insecurely on the system i.e. poor encryption, plain text, access control issues etc.
ginette
SAVE
File error occurred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AccessControl3NotesActivity
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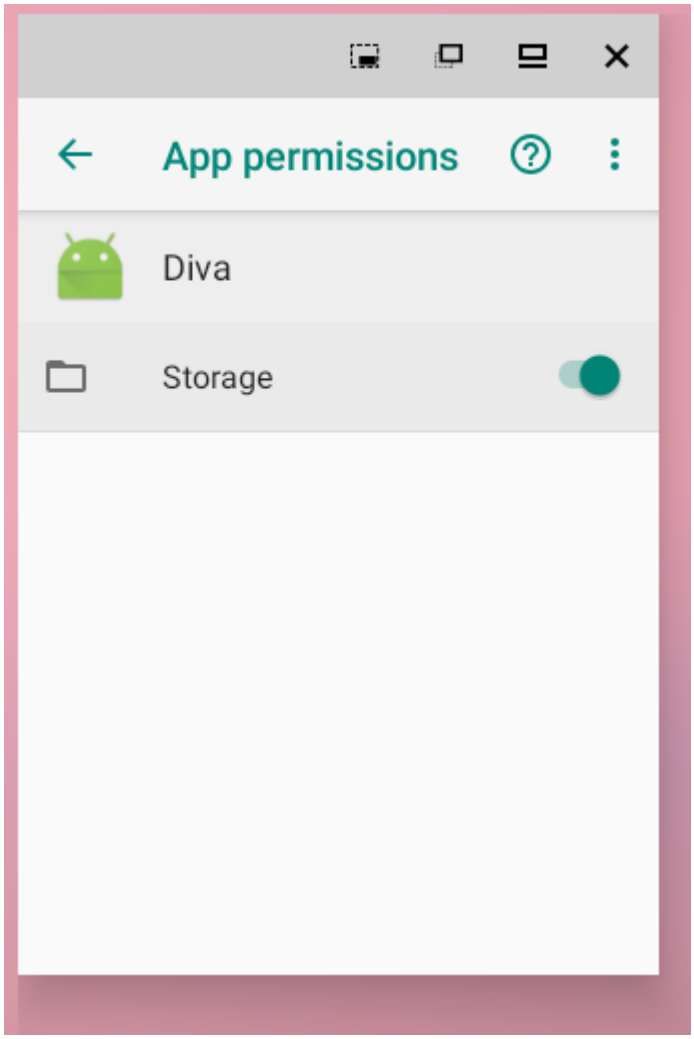
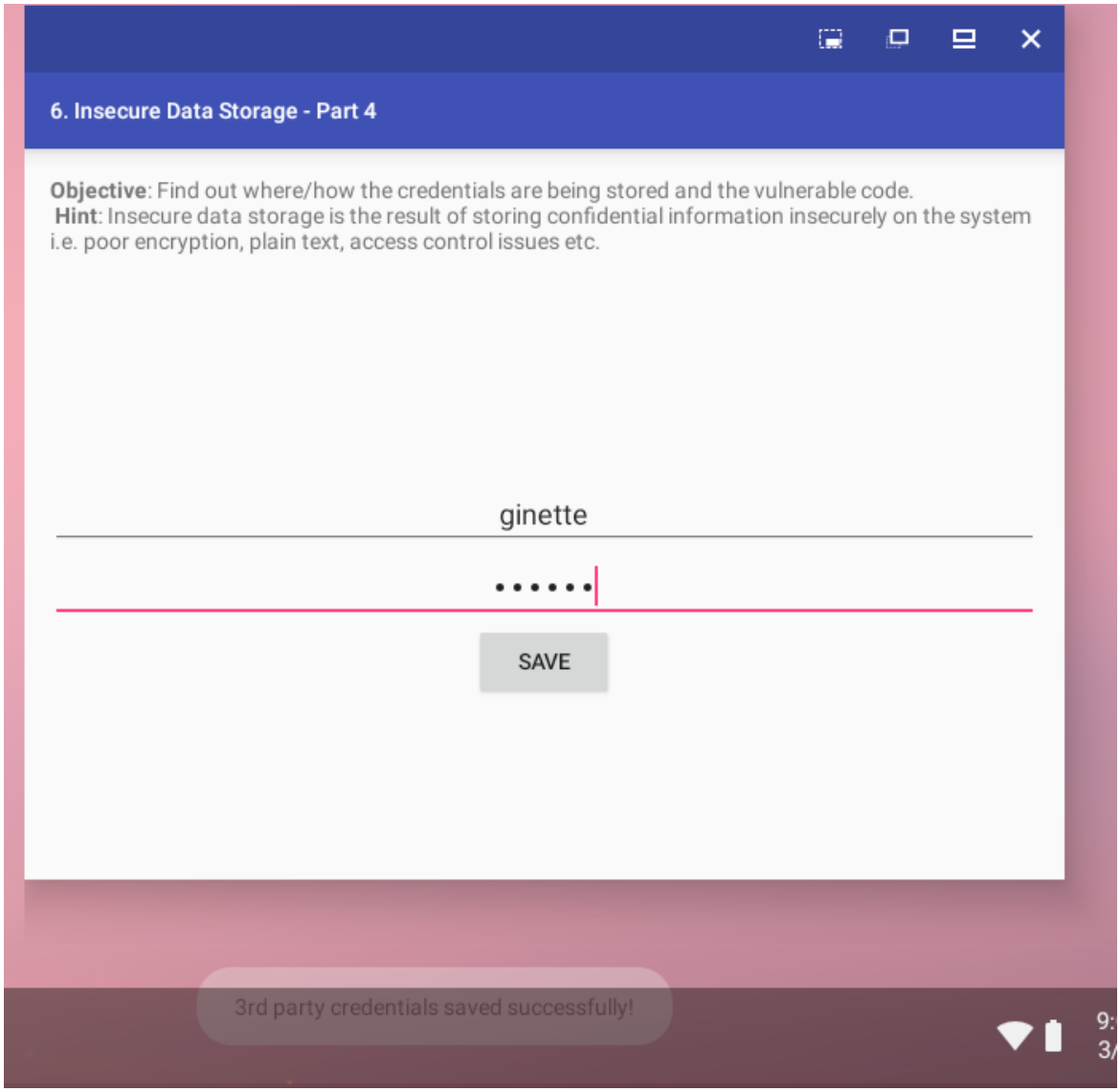
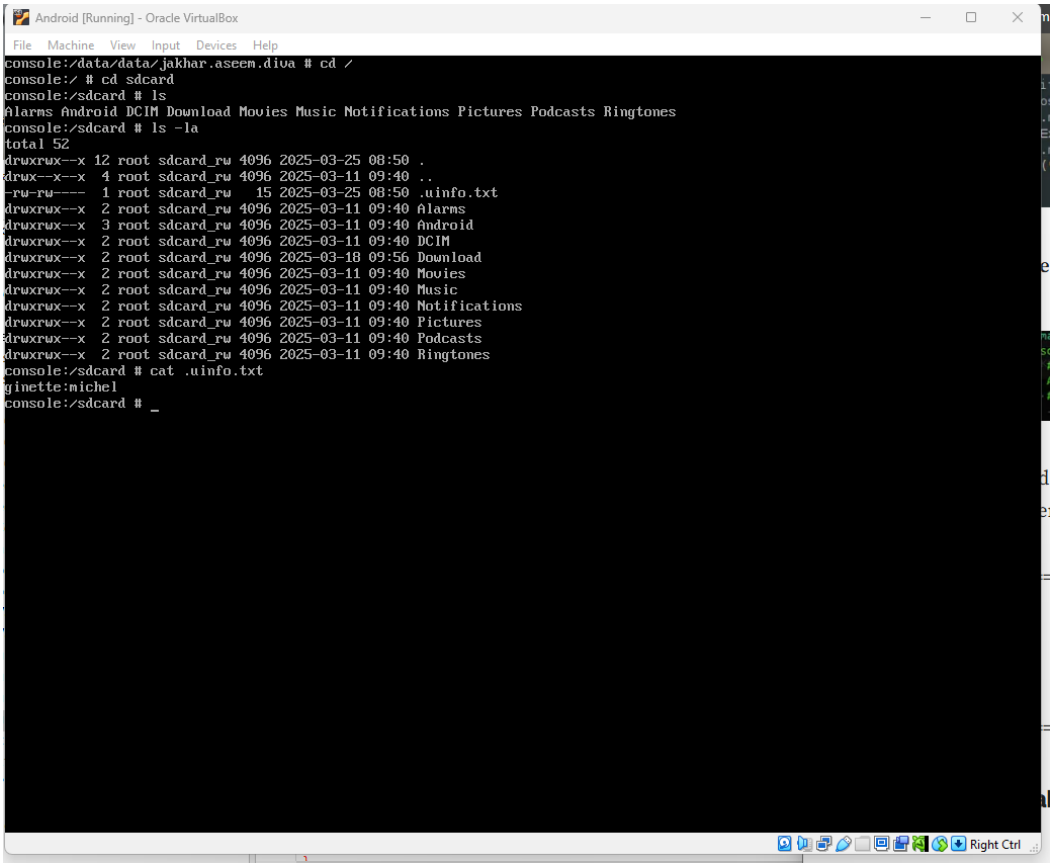
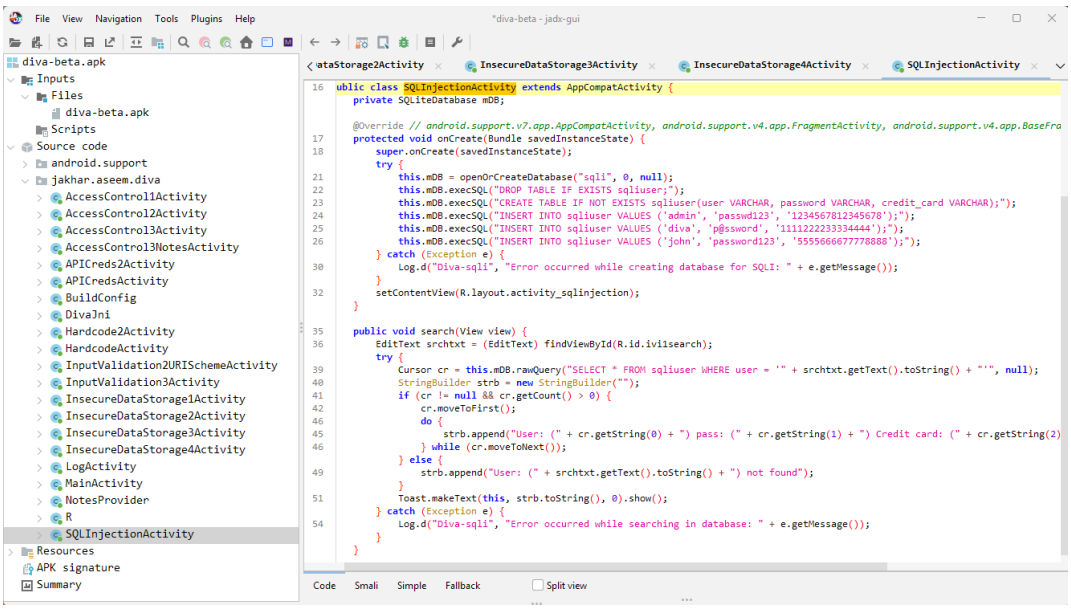
Hardcode2Activity
HardcodeActivity
InputValidation2URISchemeActivity
InputValidation3Activity
InsecureDataStorage1Activity
InsecureDataStorage2Activity
InsecureDataStorage3Activity
InsecureDataStorage4Activity
LogActivity
MainActivity
NotesProvider
R
SQLInjectionActivity
Resources
APK signature
Summary
ge1Activity
InsecureDataStorage2Activity
InsecureDataStorage3Activity
InsecureDataStorage4Activity
package jakhar.aseem.diva;
import android.os.Bundle;
import android.os.Environment;
import android.support.v7.app.AppCompatActivity;
import android.util.Log;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import java.io.File;
import java.io.FileWriter;
/* loaded from: classes.dex */
public class InsecureDataStorage4Activity extends AppCompatActivity {
@Override // android.support.v7.app.AppCompatActivity, android.support.v4.app.FragmentActivity, android.support.v4.app.BaseF
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_insecure_data_storage4);
}
public void saveCredentials(View view) {
EditText usr = (EditText) findViewById(R.id.ids4Usr);
EditText pwd = (EditText) findViewById(R.id.ids4Pwd);
File sdir = Environment.getExternalStorageDirectory();
try {
File uinfo = new File(sdir.getAbsolutePath() + "/.uinfo.txt");
uinfo.setReadable(true);
uinfo.setWritable(true);
FileWriter fw = new FileWriter(uinfo);
fw.write(usr.getText().toString() + ":" + pwd.getText().toString() + "\n");
fw.close();
Toast.makeText(this, "3rd party credentials saved successfully!", 0).show();
} catch (Exception e) {
Toast.makeText(this, "File error occurred", 0).show();
Log.d("Diva", "File error: " + e.getMessage());
}
}
}
Code
Smali
Simple
Fallback
Split view

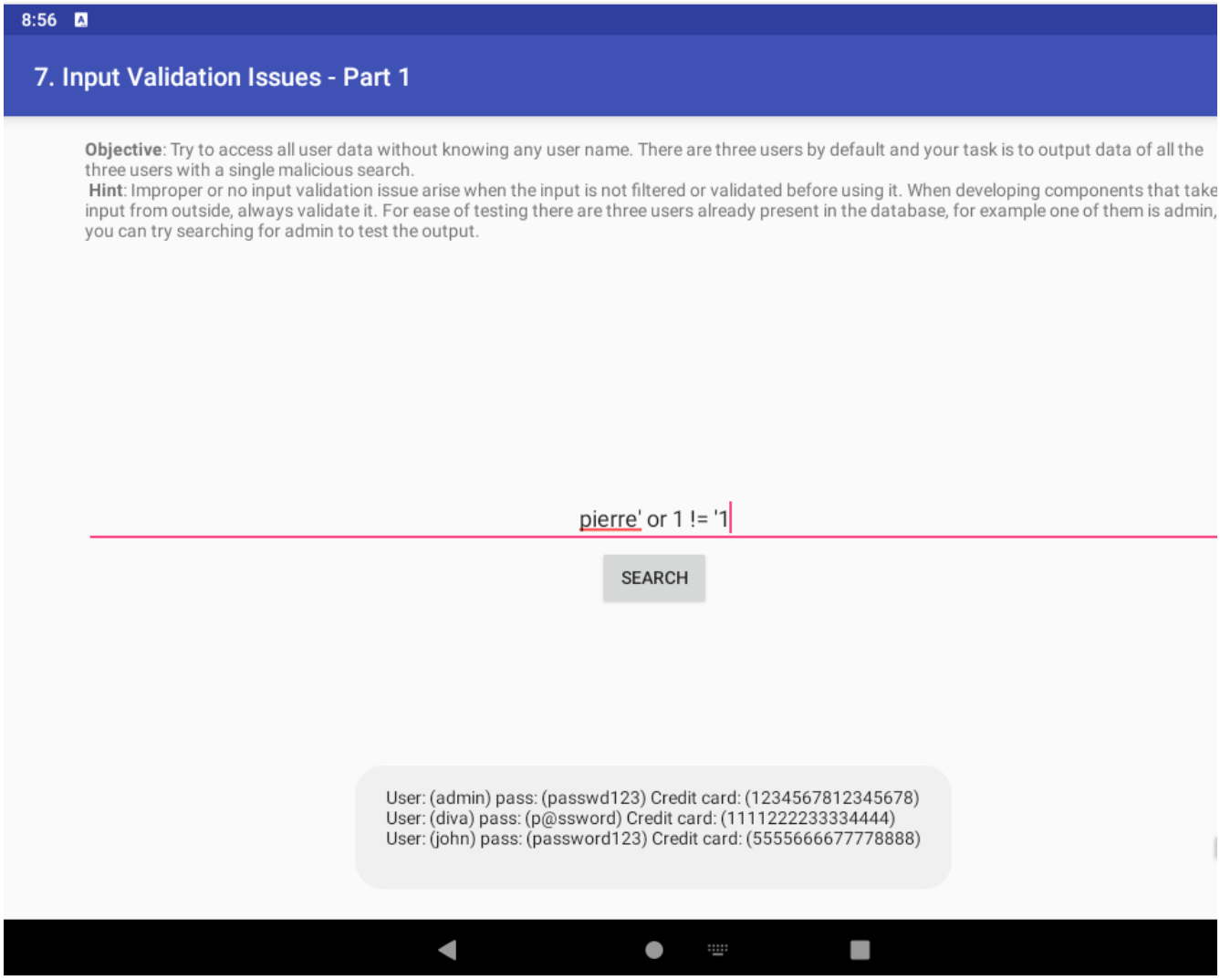

App permissions
Diva
Storage


6. Insecure Data Storage - Part 4
Objective: Find out where/how the credentials are being stored and the vulnerable code.
Hint: Insecure data storage is the result of storing confidential information insecurely on the system i.e. poor encryption, plain text, access control issues etc.
ginette
SAVE
3rd party credentials saved successfully!



#7 input validation issues part 1





fin du laboratoire.